To: Orme-Zavaleta, Jennifer[Orme-Zavaleta.Jennifer@epa.gov]; Neale, Anne[Neale.Anne@epa.gov]; McDonald, Michael E.[McDonald.Michael@epa.gov]
Cc: Williams, DavidJ[Williams.DavidJ@epa.gov]; Pilant, Drew[Pilant.Drew@epa.gov]
From: Jarnagin, Taylor
Sent: Fri 8/14/2015 9:09:24 PM
Subject: RE: remote sensing response to Gold King Mine spill into the Animas River
216-Williams.ppt
mine-water-baker's-bridge_1438884327801_22378348_ver1.0_640_480.jpg
DSC02361.jpg
Jennings 2005 P100BHBE.pdf
smime.p7s

Hi Jennifer,

Attached please see: "216-Williams.ppt". This is a presentation Dave Williams did about 15 years ago when he was with EPIC in Reston. When an item of interest has spectral qualities that set it apart from the background environment, it is relatively easy to identify and map it. This is particularly true when the water is clear, as is the case in high mountain streams such as the Animas.

A similar, high-visibility EPIC study using unique spectral signatures to map pollutants of interest is Dave Jennings' report to EPA Region 2 on the dust from the World Trade Center collapse: < EPA/600/R-03/016; attached as "Jennings 2005 P100BHBE.pdf" >.

The Gold King Mine sediments introduced into the Animas River were bright yellow in color. See "mine-water-baker's-bridge_1438884327801_22378348_ver1.0_640_480.jpg". These sediments have now fallen out of suspension and are on the stream bottom, similar to the coal ash from the Dan River spill in NC/VA a year ago. They still maintain their characteristic color; see: "DSC02361.jpg" from an aerial overflight on 8/9/2015. See more aerial photos at: < http://sanjuancitizens.org/ecoflight-over-gold-king-mine-blowout-august-9-2015/ >. Just using color alone would be sufficient to make a preliminary map of deposition. Hyperspectral imagery would be able to find concentrations of items of interest at much lower levels of deposition.

There is quite a large body of literature on the use of remote sensing (RS) of mining environments and the various sensors that can be used. I am sure that Drew and Dave are more familiar with this literature than I am and with the current technical capabilities of the use of RS in these cases than I am. I have included them in the Cc section of this e-mail.

I hope this is somewhat useful.

Taylor

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 < http://www.epa.gov/nerlesd1/land-sci/staff/jarnagin.htm >

Main Research Project:

"Collaborative Research: Streamflow, Urban Riparian Zones, BMPs, and Impervious Surfaces":

 < http://www.epa.gov/nerlesd1/land-sci/clarksburg01-05.htm >

From: Orme-Zavaleta, Jennifer

Sent: Friday, August 14, 2015 3:53 PM
To: Neale, Anne; McDonald, Michael E.; Jarnagin, Taylor
Subject: RE: remote sensing response to Gold King Mine spill into the Animas River

Taylor et al. Can you send me a sample output that can help convey what this capability can bring? Interest here, just need to help demonstrate what this does in a simple way to non users. Thanks

Sent from my Windows Phone

From: Neale, Anne
Sent: 8/14/2015 14:01
To: Orme-Zavaleta, Jennifer; McDonald, Michael E.
Subject: FW: remote sensing response to Gold King Mine spill into the Animas River

Hi Jennifer and Mike,

You may already have spoken to Blake or others but Taylor brings up a really great point about remote sensing capabilities.

Annie

Anne Neale

EnviroAtlas Project Lead

US EPA, RTP, NC

919-541-3832

From: Jarnagin, Taylor
Sent: Friday, August 14, 2015 1:42 PM
To: Neale, Anne
Subject: remote sensing response to Gold King Mine spill into the Animas River
Importance: High

Hi Annie,

I think this is an excellent candidate for the use of remote sensing with a multispectral or hyperspectral sensor to identify and map the sediments from the Gold King Mine spill into the Animas River.

Our local talent includes: Blake Schaeffer and Drew Pilant (both of whom could analyze imagery) and David J. Williams (who is working on putting together a sensor just for this type of occasion, unfortunately, I don't think that sensor has been fully tested and is operation right now). The Environmental Photographic Interpretation Center existed for exactly this sort of emergency response capability and to act as a liaison between the contractors who would fly and analyze the imagery and the Regions who had the boots on the ground and were directly responsible for the clean-up.

Our current contact for the capability to do this is:

H. Craig Seaver

Remote Sensing Manager

EPA National Computer Center

Office of Technology Operations and Planning

Office of Environmental Information

Phone: (919) 541-4436

Email: seaver.craig@epa.gov

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